

relictual descendents of a more widely distributed ancestral form. The collection made by Vortriede in 1892, which is cited first in connection with the original description of *Chlorogalum purpureum*, apparently has been lost. Under the circumstances, it seems logical to accept the Eastwood collection of 1893, on which it is evident that the description was mainly based, as the type.

EXCLUDED SPECIES

Chlorogalum Leichtlinii Baker, Gard. Chron. ser. 2, 1: 689. 1874. = *CAMASSIA LEICHTLINII* (Baker) Wats., Proc. Am. Acad. 20: 376. 1885.

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NOTES ON DRABA IN THE SIERRA NEVADA

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Field and herbarium studies upon the alpine vascular flora of the Sierra Nevada of California have been carried on by the writer during the past several years. In these studies certain observations on the perennial scapose species of the genus *Draba* have been made which are herein recorded.

DRABA ASTEROPHORA Pays. Am. Journ. Bot. 4: 263. 1917.

Draba asterophora has not been recorded in the literature as occurring in California. Mount Rose, Washoe County, Nevada, the type locality, was the sole station known to Payson for the species. This mountain, which adjoins the Lake Tahoe area, is geologically and topographically a part of the Sierra Nevada, and the existence of *D. asterophora* in the latter range adjacent to Mount Rose is to be expected. The collections now available for this species extend the known range slightly into California, but still indicate its apparent restriction to the alpine region adjacent to Lake Tahoe on the east and south.

Draba asterophora is distinct in the field. The obovate to oblanceolate leaves are thick and almost fleshy and are thus readily distinguishable from those of the related *D. Lemmonii*, from which species *D. asterophora* differs also in its cruciform rather than

simple trichomes, and in its definitely winged rather than wingless seeds. In the region of Jobs Sister Peak just south of Lake Tahoe, *D. asterophora* appears to replace *D. Lemmonii* ecologically.

The following collections of *Draba asterophora* are all deposited in the University of California Herbarium.

NEVADA. Washoe County: Mount Rose, 9000 feet (indicated as up to 10,800 feet on a duplicate collection), *Kennedy 1154* (isotype); Contact, Mount Rose, 9000 feet, *Heller 10940*. CALIFORNIA. Eldorado County: Jobs Sister, 10,000 feet, July 28, 1918, *H. M. Evans*; Cup Lake (exact location dubious but probably in the vicinity of Jobs Sister), July 21, 1918, *H. M. Evans*; above Star Lake (on Jobs Sister), July 11, 1920, *H. M. Evans*; Jobs Sister, 10,000 feet, *C. W. Sharsmith 3503*; saddle between Jobs Peak and Freel Peak, *C. W. Sharsmith 3502*; north slope of Freel Peak, 10,200 feet, *C. W. Sharsmith 3472*.

DRABA GLOBOSA PAYS, var. SPHAERULA (Macbr. & Pays.) O. E. Schulz, Pflanzenreich 4¹⁰⁵: 103. 1927. *D. sphaerula* Macbr. & Pays. Am. Journ. Bot. 4: 258. 1917.

Collections of the dwarf, caespitose, scapose species of *Draba* from the alpine Sierra Nevada south of Lake Tahoe, particularly those of *D. oligosperma* Hook., have almost invariably contained an admixture of *D. globosa* var. *sphaerula*. The existence of *D. globosa* var. *sphaerula* in this region, however, has never been recognized. This variety is distinct from other alpine representatives of the genus which occur in the Sierra Nevada south of the Tahoe section in that it possesses linear, glabrous, ciliate-margined leaves, yellow petals, and flattened silicles. Occasionally, in addition to cilia, the leaves have a few simple trichomes on both surfaces near the apex, but these trichomes are never stellate or branched. Payson and others have pointed out the diagnostic value of the leaf trichomes in *Draba*. This character furnishes a reliable criterion for distinguishing the perennial scapose species of the alpine Sierra Nevada.

Under *Draba globosa* var. *sphaerula*, Schulz (*op. cit.*) lists *D. vestita* Pays., *partim*, and *D. Paysonii* Macbr. as synonyms. Both of these names should be excluded from the synonymy: *Draba vestita* Pays. is a homonym of *D. vestita* Davidson, this latter being a synonym of *D. corrugata* Wats., and the plants referred to in *D. vestita* Pays. are properly included in *D. Paysonii* Macbr. (*Contr. Gray Herb. n. ser. 56: 52. 1918*). *Draba Paysonii* is a valid species, characterized by having branched or stellate trichomes in addition to cilia on the leaves, and is related, by the character of the trichomes at least, to *D. densifolia* Nutt.

Schulz, in the same treatment, lists *Draba glacialis* var. *pectinata* Wats., *partim*, as a synonym under *D. globosa*. Following Payson (*op. cit.*, 260), *D. glacialis* var. *pectinata* Wats. (*Proc. Amer. Acad. 23: 260. 1888*) and *D. pectinata* Rydb. (*Bull. Torr.*

Bot. Club 39: 327. 1912) "seem according to specimens labeled by Rydberg in the Gray Herbarium to be referable to *D. oligosperma*." Thus the identity of *D. glacialis* var. *pectinata* appears uncertain despite the fact that both Watson's and Rydberg's descriptions are in large part correct for *D. globosa*. Acceptance of Payson's decision clarifies the conception of *D. globosa*, and restricts its meaning to those plants which have linear, glabrous (or glabrate) leaves with ciliate margins.

The relationship of *Draba globosa* is thus close to *D. Nelsonii* Macbr. and Pays., both species possessing linear, glabrous leaves with ciliate margins. The occurrence of *D. Nelsonii* in the Tahoe region of the Sierra Nevada and northward has been indicated by Payson (*op. cit.*, 259, "Mount Stanford, Nevada County, July, 1892, *Sonne 14*; Castle Peak [Mount Stanford], Nevada County, August 3, 1903, *Heller*; Modoc County, 1898, *Mrs. Bruce*"). In addition to the *Sonne* collection cited above, there are in the University of California Herbarium two other *Sonne* collections of *D. Nelsonii* from Mount Stanford, made in 1884 and 1897 respectively. Jepson (*Fl. Calif.* 2: 97. 1936) erroneously refers two of these (probably the latter two) to *D. oligosperma*.

Apparently *Draba globosa* is represented in the alpine Sierra Nevada only by the variety *sphaerula*. If close genetic connection of this group with *D. Nelsonii* be assumed, the Sierran representative of *D. globosa*, in the form of var. *sphaerula*, may be interpreted as a partial derivative of *D. Nelsonii*, from which it differs in being more strictly alpine with consequent nanism.

Representative material of *Draba globosa* var. *sphaerula* (all deposited in Herb. Univ. Calif.) follows: CALIFORNIA. Eldorado County: Freel Peak, *C. W. Sharsmith 3489*. Mono County: Lundy Trail, Mount Warren, 12,000 feet, August 21, 1894, *J. W. Congdon*; between Tower Peak and Saurian Crest, *C. W. Sharsmith 3726*; between Leevining Peak and Mount Warren, 11,400 feet, *C. W. Sharsmith 2818*; Dana Plateau, east of Mount Dana, 12,000 feet, *C. W. Sharsmith 2420, 2443*. Tuolumne County: pass between Mount Dana and Mount Gibbs, 11,000 feet, September, 1897, *J. G. Lemmon* (U.C. 10482 in part, as to plant with glabrous, ciliate-margined leaves); summit of Mount Dana, July, 1901, *H. M. Evans*; northwest plateau of Mount Dana, 11,450 feet, *C. W. Sharsmith 265*.

***Draba sierrae* sp. nov.** Herba perennans caespitosa, caudicis ramis tenuibus elongatis; folia anguste oblonga oblanceolata obtusa obtusiusculave, 2.0–6.5 mm. longa, leviter uninervata, dense imbricata in aetate albida marcescentia, dense puberula, trichomatibus ramosis adscendentibus, 0.1–0.5 mm. longis; scapi puberuli, floribus racemosis; sepala ovalia obovatave puberula, 2.0–3.5 mm. longa; petala spatulata, lutea, 4–5 mm. longa; siliculae puberulae 3.5–7.0 mm. longae, plerumque asymmetricae contortae; styli 0.5–1.0 mm. longi.

Perennial cespitose herb branching from a shallowly to deeply rooted caudex, branches numerous, slender and elongate (usually less than 1 mm. in diameter) with lower portion stramineous; leaves with an evident but not strongly developed midnerve toward the base or sometimes extending to the apex, narrowly oblong to oblanceolate, obtusish to obtuse, 2–6.5 mm. long, densely imbricated on the slender stems, marcescent-persistent, tissue of the dead leaves fading whitish, densely puberulent on both surfaces with minute branching trichomes 0.1–0.5 mm. long, trichomes longest on the basal margins, their branches few and usually ascending; flowering stems usually scapose, numerous, 1.5–4 cm. long, puberulent with trichomes as on leaves; inflorescence short-racemose, elongating slightly in fruit; pedicels 2–5 mm. long; sepals oval to ovate or obovate, 2–3.5 mm. long, pale greenish-yellow, dorsally sparsely and minutely puberulent with trichomes as on leaves; petals spatulate, entire, 4–5 mm. long, cadmium to light cadmium yellow, fading to naphthalene yellow¹ (yellowish-white); silicles predominantly lanceolate, occasionally ovate or orbicular, 3.5–7 mm. long, once or twice twisted or at least undulate, usually contorted and more or less strongly asymmetric, uniformly puberulent with trichomes as on leaves; styles 0.5–1 mm. long; seeds 1 mm. long, wingless.

Type. In unglaciated granitics on summit of divide leading to Mount Mills from Mono Pass at head of Rock Creek, altitude 12,500 feet, Sierra Nevada, northwestern Inyo County, California, August 8, 1937, *C. W. Sharsmith 3058* (Herb. Univ. Calif. no. 624298); isotypes at Gray, Kew, U. S. Nat., N. Y. Bot. Gard., Mo. Bot. Gard., Stanford, and other herbaria.

Other collections. In granitics just above highest Pleistocene lateral moraine on western slope of Mount Morgan, 11,500 feet, Rock Creek Lake Basin, Sierra Nevada, northwestern Inyo County, California, August 6, 1937, *C. W. Sharsmith 2999* (Herb. Univ. Calif., duplicates in same herbaria as isotypes); Inconsolable Range (head of South Fork of Bishop Creek, Inyo County), California, July 24, 1929, *Peirson 8549* (Peirson Herb.; depauperate form with immature, flat silicles).

DRABA CRUCIATA Pays. Am. Journ. Bot. 4: 265. 1917. *D. nivalis* Liljb. var. *californica* Jepson, Man. Fl. Pl. Calif. 444. 1925.

The type locality of *Draba cruciata* Pays. is "vicinity of Mineral King, Tulare County, California" (*Hall and Babcock 5361*). The type locality of *D. nivalis* Liljb. var. *californica* Jepson is likewise Mineral King (July 22, 1892, *T. S. Brandegee*). Examination of an isotype of *D. cruciata* and an isotype (or perhaps the type, although undesignated) of *D. nivalis* var. *californica*, both deposited in the University of California Herbarium, show the

¹Ridgway, R. Color Standards and Color Nomenclature. Washington, D. C. 1912.

two specimens to be conspecific. The Brandegee specimen is slightly more mature, but the two are otherwise identical. The following specimen of *D. cruciata* (determination communicated by Dr. C. Leo Hitchcock) extends the known range of this apparently rare species northward: Dick's Peak, Tahoe, Eldorado County, 10,000 feet, *F. J. Smiley 432* (Gray Herb.).

Draba nivalis Liljb. is a holarctic species reported for Utah (Rydberg, Fl. Rocky Mts. and Adj. Plains, 354. 1922) and Colorado (Payson, *op. cit.*, 262), although the Colorado plants according to Payson "are not typical." In *D. nivalis* the petals are white and the fruiting styles 0.1–0.4 mm. long, whereas *D. cruciata* has yellow petals and fruiting styles up to 1 mm. long.

DRABA CRUCIATA Pays. var. *integrifolia* C. L. Hitchcock & C. W. Sharsmith var. nov. Folia quam in specie tenuiora integra, trichomatibus sparsioribus longioribus; siliculae contortae reticulatae muriculatae; styli 1.0–2.0 mm. longi.

Leaves thinner than in the species, flaccid, sparsely pubescent on both surfaces with few-branched cruciform or simple trichomes 0.4–1.5 mm. long, trichomes longest on the basal margins; silicles contorted, predominantly lanceolate, sometimes attenuate, glabrous and smooth to reticulate-veined or muriculate or warty-roughened especially on or near the margins, occasionally minutely hispidulous with usually simple, bristle-like trichomes; styles 1–2 mm. long.

Type. Abundant in rock crevices in sheltered granite sand pockets above Mirror Lake, 11,000 feet, canyon of Lone Pine Creek, east of Mount Muir, Mount Whitney region, Sierra Nevada, Inyo County, California, August 21, 1937, *C. W. Sharsmith 3353* (Herb. Univ. Calif. no. 624297; isotypes at Gray, Kew, U. S. Nat., N. Y. Bot. Gard., Mo. Bot. Gard., Stanford and other herbaria).

Other collections. In sheltered places on buttress in cirque east of Mount Muir, head of canyon of Lone Pine Creek, 12,400 feet, Sierra Nevada, Inyo County, California, *C. W. Sharsmith 3338* (Herb. Univ. Calif., Gray, Kew, U. S. Nat., Mo. Bot. Gard., Stanford, Univ. Wash.); slopes of University Peak, Fresno County, 13,000 feet, *R. S. Ferris & R. Bacigalupi 3823* (Stanford).

The affinities of *Draba cruciata* have not been clear in the past. Payson (*op. cit.*, 265) states that "the relationship of this plant is not at all evident . . . Hall suggests it is near *D. Lemmonii*." *Draba cruciata* var. *integrifolia*, however, offers definite evidence of a close affinity between *D. cruciata* and *D. sierrae* in the shape of the pods, the usually oblique position of the style, and the nature of the trichomes.

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